Fuel Finder Version IV

VAPOR-PHASE OUT-OF-TANK PRODUCT DETECTOR

Detector:

Output type: quantitative
Sampling frequency: intermittent *
Operating principle: adsorption sampling

*** California regulations require vadose zone vapor monitoring to be continuous. This sensor does not meet the criteria.**

Test Results:

	benzene	2-methylbutane
Accuracy (%) [Avg. Reading]	106.8 [1647 ppm]	122.7 [1380 ppm]
Bias (%)	64.5	38.2
Precision (%)	22.3	53.2
Detection time (min:sec)	N/A*	N/A
Fall time (min:sec)	N/A	N/A
Lower detection limit (ppm)	77	116

* See glossary.

Specificity Results:

Percentages:	
benzene	147.7
n-butane	90.7
n-hexane	55.7
isobutane	51.1
2-methylpentane	143.7
toluene	66.5

Environmental Fuel Systems, Inc.
P.O. Box 1899
Bandera, TX 78003
Tel: (800) 375-7747

Evaluator: Carnegie Mellon Research Institute
Tel: (412) 268-3495

Date of Evaluation: 04/20/93

FCI Environmental, Inc.

Analog Hydrocarbon Probe AHP-100 and Digital Hydrocarbon Probe DHP-100

LIQUID-PHASE OUT-OF-TANK PRODUCT DETECTOR

Detector:

Output type: qualitative
Sampling frequency: continuous
Operating principle: fiber optic chemical sensor

Test Results:

	unleaded gasoline	synthetic gasoline
Accuracy (%)	100	100
Detection time (min)	<8	<8
Fall time (min)	<5	<5
Lower detection limit (cm)	<0.01	<0.01

Specificity Results:
Activated: unleaded gasoline, synthetic gasoline, n-hexane, diesel fuel, jet-A fuel, toluene, xylene(s).

Comments:
EPA and many states require detection of 1/8 inch (0.32 cm) of product for groundwater monitoring. Detector is reusable.

FCI Environmental, Inc.
1181 Grier Dr., Bldg. B
Las Vegas, NV 89119
Tel: (800) 510-3627

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 01/15/94

FCI Environmental, Inc.

Analog Hydrocarbon Probe AHP-100

VAPOR-PHASE OUT-OF-TANK PRODUCT DETECTOR

Detector:

Output type: quantitative
Sampling frequency: continuous
Operating principle: fiber optic

Test Results:

	EPA March 1990 protocol			Radian June 1990 protocol	
	xylene	benzene	2-methylbutane	unleaded gasoline	synthetic gasoline
Relative accuracy* (%)	2	35	N/R*	12	22
Bias (%)	1	-23	N/R	-7	-2
Precision (%)	1	11	N/R	4	15
Detection time (min)	<1	<1	N/R	<1	<1
Fall time (min)	<1	<1	N/R	<1	<1
Lower Detect. Limit (ppm)	84	519	N/R	137	220

* See glossary.

Lower detection limit for other fuels (ppm):

diesel	JP-4 jet fuel	JP-8 jet fuel	synthetic fuel	p-xylene	kerosene	unleaded gasoline
1.01	3.08	2.22	3.43	2.60	2.18	2.02

Specificity Results (%) (corrected for sensitivity differences):

EPA March 1990 protocol		Radian June 1990 protocol	
benzene	76	unleaded gasoline	93
toluene	96	synthetic gasoline	98
p-xylene	101	JP-4 jet fuel	105
synthetic gasoline	100	n-hexane	N/R
trimethylbenzene	107	xylene	103
methane	N/R		
butane	N/R		
2-methylbutane	N/R		
pentane	N/R		

Comments:

Test procedures used were a combination of EPA's "Standard Test Procedures for Evaluation Leak Detection Methods: Vapor-Phase Out-of-Tank Product Detectors, "March 1990, and Radian Corporation's draft report "Development of Procedures to Assess the Performance of External Leak Detection Devices: Vapor-Phase ASTM-Formatted Methods," June 6, 1990.

FCI Environmental, Inc.
1181 Grier Dr., Bldg. B
Las Vegas, NV 89119
Tel: (800) 510-3627

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 03/07/94 and 12/05/94

FCI Environmental, Inc.

Digital Hydrocarbon Probe DHP-100

VAPOR-PHASE OUT-OF-TANK PRODUCT DETECTOR

Detector:

Output type: quantitative
Sampling frequency: continuous
Operating principle: fiber optic

Test Results:

	EPA March 1990 protocol			Radian June 1990 protocol	
	xylene	benzene	2-methylbutane	unleaded gasoline	synthetic gasoline
Relative accuracy* (%)	0	17	N/R*	18	29
Bias (%)	0	-9	N/R	1	-12
Precision (%)	0	11	N/R	9	10
Detection time (min)	<1	<1	N/R	<1	<1
Fall time (min)	<1	<1	N/R	<1	<1
Lower Detect. Limit (ppm)	45	280	N/R	73	118

* See glossary.

Specificity Results (%) (corrected for sensitivity differences):

EPA March 1990 protocol	
benzene	89
toluene	97
p-xylene	100
synthetic gasoline	92
trimethylbenzene	104
methane	N/R
butane	N/R
2-methylbutane	N/R
pentane	N/R

Radian June 1990 protocol	
unleaded gasoline	101
synthetic gasoline	88
JP-4 jet fuel	109
n-hexane	108
xylene	N/R

Comments:
Test procedures used were a combination of EPA's "Standard Test Procedures for Evaluation Leak Detection Methods: Vapor-Phase Out-of-Tank Product Detectors," March 1990, and Radian Corporation's draft report "Development of Procedures to Assess the Performance of External Leak Detection Devices: Vapor-Phase ASTM-Formatted Methods," June 6, 1990.

FCI Environmental, Inc.
1181 Grier Dr., Bldg. B
Las Vegas, NV 89119
Tel: (800) 510-3627

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 03/07/94

FDR Services, Inc.

GasPak Vapor Monitoring System

VAPOR-PHASE OUT-OF-TANK PRODUCT DETECTOR

Detector:

Output type: quantitative
Sampling frequency: intermittent *
Operating principle: product permeable detector

*** California regulations require vadose zone vapor monitoring to be continuous. This sensor does not meet the criteria.**

Test Results: (averages of multiple concentrations)

	benzene	heptane, 3-methyl	hexane	Iso-octane	pentane, 2,4-dimethyl	pentane, 2,3,4-trimethyl	toluene	m-xy
Accuracy (%)	103	102	107	103	105	104	104	99
Bias (%)	-1	1	2	1	1	1	1	-6
Precision (%)	2	2	4	2	3	3	3	4
Lower detection limit (ppm)	1	1	1	1	3	1	1	4
Specificity (%)	100	100	102	101	101	100	100	94

Specificity Results: See results above.

Comments:
Test procedures used were modified by evaluator from EPA's "Standard Test Procedures for Evaluating Leak Detection Methods: Vapor-Phase Out-of-Tank Product Detectors," March 1990.
Detection times were not directly measured. However, evaluator states, “experiential evidence predicts that the detector response will reach ‘alarm’ conditions (30% of maximum fresh fuel response) at a distance of 5 meters in slightly over one day.”
Each cartridge is used once, then replaced by another.
GasPak is produced and analyzed by Fayette Environmental Services, Inc., with exclusive marketing and implementation rights assigned to FDR Services, Inc.

FDR Services, Inc.
P.O. Box 3930
Bryan, TX 77805
Tel: Not Available

Evaluator: David G. Bray, Ph.D.
University of Missouri - Columbia
Tel: (573) 882-2439
Date of Evaluation: 07/27/94

FE Petro, Inc.

STP-MLD Pipeline Leak Detector

AUTOMATIC MECHANICAL LINE LEAK DETECTOR

Certification: Leak rate of 3.0 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 2.0 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oil #4, and some solvents.

Specification: System tests fiberglass and steel pipelines.
Tests are conducted at operating pressure.

Pipeline Capacity: Maximum of 129.14 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Response time is less than 30 seconds.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Restricted flow to dispenser if leak is declared.

Calibration: **System must be checked annually for capability of detecting a line leak of 3.0 gph.**

FE Petro, Inc.
P.O. Box 139
McFarland, WI 53558
Tel: (608) 838-8786

Evaluator: Ken Wilcox Associates, Inc.
Tel: (816) 443-2494

Date of Evaluation: 07/01/92

FE Petro, Inc.

STP-MLD-D Pipeline Leak Detector

AUTOMATIC MECHANICAL LINE LEAK DETECTOR

Certification: Leak rate of 3.0 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 2.0 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds
this threshold.

Applicability: Diesel

Specification: System tests steel and fiberglass pipelines.
Tests are conducted at operating pressure.

Pipeline Capacity: Maximum for rigid system is 341 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Average response time is 1 minute.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Restricted flow to dispenser if leak is declared.

Calibration: **System must be checked annually for capability of detecting a line leak of 3.0 gph.**

FE Petro, Inc.
P.O. Box 139
McFarland, WI 53558
Tel: (608) 838-8786

Evaluator: Ken Wilcox Associates, Inc.
Tel: (816) 443-2494

Date of Evaluation: 04/30/94

FE Petro, Inc.

STP-MLD-E Line (Flexline) Leak Detector (for Flexible Pipelines)

AUTOMATIC MECHANICAL LINE LEAK DETECTOR

Certification: Leak rate of 3.0 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 2.0 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and some solvents.

Specification: System tests flexible pipelines.
Tests are conducted at operating pressure.

Pipeline Capacity: Maximum of 49.6 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Average response time is 3 minutes.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Restricted flow to dispenser if leak is declared.

Calibration: **System must be checked annually for capability of detecting a line leak of 3.0 gph.**

Comments: Enviroflex line with a bulk modulus* of 1,280 was used during evaluation.
*See glossary.

FE Petro, Inc.
P.O. Box 139
McFarland, WI 53558
Tel: (608) 838-8786

Evaluator: Ken Wilcox Associates, Inc.
Tel: (816) 443-2494

Date of Evaluation: 03/24/94

Fluid Containment, Inc.
(formerly O/C Tanks Corp.)

Hydrostatic Precision Tank Test for DWT-Type II Tanks

DOUBLE WALLED TANK TIGHTNESS TEST

Certification: Leak rate of 0.1 gph with P_D=99.9% and P_{FA}=1.2% without dispensing.
Leak rate of 0.1 gph with P_D=95% and P_{FA}=5.0% with dispensing.

Leak Threshold: 0.05 gph without dispensing and 0.07 gph with dispensing. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and fuel oil #4.

Tank Capacity: Maximum of 30,000 gallons.
Tank must be between 0 and 100% full.
Maximum tank diameter is 10 feet.

Waiting Time: Minimum of 24 hours between delivery and testing.
Minimum of 3 hours between "topping off" the annular space with liquid and testing.
There must be no delivery during waiting time.

Test Period: Minimum of 4 hours.
A leak is not declared unless the threshold is exceeded in two tests, separated by at least 8 hours which are performed without dispensing and with minimal changes in groundwater elevation above bottom of tank as described below.

Other Limitations: Volume of trapped vapor must not exceed 20 gallons.
Change in barometric pressure must be less than 0.04 psia over the 4-hour test period.
Annular space must be at least 100% full with either water or antifreeze.
If groundwater is above bottom of tank, and no product is being dispensed during test, total change in groundwater elevation during test must be less than 1.5 inches per hour.
If groundwater is below bottom of tank or not changing during test,
total change in product level during test must be less than 0.75 inch per hour.

Fluid Containment, Inc.
Route 20, Box 1380
Conroe, TX 77301
Tel: (800) 628-2657

Evaluator: Vista Research
Tel: (415) 966-1171

Date of Evaluation: 05/15/91

Gasboy International (formerly William M. Wilson's Sons)

Gasboy TMS 500
(Magnetostrictive Probe)
AUTOMATIC TANK GAUGING SYSTEM

Certification: Leak rate of 0.2 gph with P_D = 99.91% and P_{FA} = 0.09%.

Leak Threshold: 0.1 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Tank Capacity: Maximum of 15,000 gallons.
Tank must be between 50 and 95% full.

Waiting Time: Minimum of 6 hours between delivery and testing.
There must be no dispensing or delivery during waiting time.

Test Period: Minimum of 3 hours.
Test data are acquired and recorded by a computer.
Leak rate is calculated from data determined to be valid by statistical analysis.
There must be no dispensing or delivery during test.

Temperature: Average for product is determined by a minimum of 5 temperature sensors.

Water Sensor: Must be used to detect water ingress.
Minimum detectable water level in the tank is 1.04 inches.
Minimum detectable change in water level is 0.011 inch.

Calibration: Temperature sensors and probe must be checked and calibrated in accordance with manufacturer's instructions.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.
As product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product.
California regulations require at least one test per month after routine product delivery or when the tank is filled to within 10% of the highest operating level during the previous month.
System is no longer being manufactured although product support is still available.

Gasboy International
P.O. Box 309
Lansdale, PA 19446
Tel: (215) 855-4631

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 05/10/91

Gems Sensors Inc. (formerly IMO Industries Inc.)

Gems Smartwell Portable Monitor model WPM-535 with Groundwater Probe model WP-535

LIQUID-PHASE OUT-OF-TANK PRODUCT DETECTOR

Detector:

Output type:	qualitative
Sampling frequency:	intermittent*
Operating principle:	conductive polymer

*Although sensor is a polymer strip which is mounted in the monitoring well, monitor is a hand held unit which is typically connected to sensor periodically - hence the "intermittent" designation.

Test Results:

	unleaded gasoline	synthetic gasoline
Accuracy (%)	100	100
Detection time (min:sec)	09:31	07:05
Fall time (min:sec)	55:42	17:04
Lower detection limit (cm)	0.04	0.08

Specificity Results:
Activated: unleaded gasoline, synthetic gasoline, n-hexane, diesel fuel, jet-A fuel, toluene, xylene(s).

Comments:
EPA and many states require detection of 1/8 inch (0.32 cm) of product for groundwater monitoring. Detector is reusable.

Gems Sensors Inc.
Cowles Rd.
Plainville, CT 06062-1198
Tel: (800) 847-5691

Evaluator: Carnegie Mellon Research Institute
Tel: (412) 268-3495

Date of Evaluation: 04/22/93

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA02630000501

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 3.0 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 1.5 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized fiberglass and steel pipelines.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 158 gallons.

Waiting Time: None between delivery and testing.
Minimum between dispensing and testing depends on volume o f product and temperature gradient which is determined by the system's computer.

Test Period: Response time is 14 seconds.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown, message display, and alarm activation if a leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600
Rev. by Ken Wilcox Associates, Inc.
Tel: (816) 443-2494
Date of Evaluation: 09/20/91, Rev. 04/12/93

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA02630000501

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.2 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 0.1 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized fiberglass and steel pipelines.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 158 gallons.

Waiting Time: None between delivery and testing.
Minimum between dispensing and testing depends on volume of product and temperature gradient which is determined by the system's computer.

Test Period: Response time is 6 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown, message display, and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
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Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600
Rev. by Ken Wilcox Associates, Inc.
Tel: (816) 443-2494
Date of Evaluation: 09/20/91, Rev. 04/12/93

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA02630000501

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.1 gph with P_D=100.0% and P_{FA}=0%.

Leak Threshold: 0.079 gph.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized fiberglass and steel pipelines.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 158 gallons.

Waiting Time: None between delivery and testing.
Minimum between dispensing and testing depends on volume of product and temperature gradient which is determined by the system's computer.

Test Period: Response time is 14 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown, message display, and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600
Rev. by Ken Wilcox Associates, Inc.
Tel: (816) 443-2494
Date of Evaluation: 09/20/91, Rev. 04/12/93

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA02630000501 (for Flexible Pipelines)

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 3.0 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 1.5 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized flexible pipelines.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 49.6 gallons.

Waiting Time: None between delivery and testing.
Minimum between dispensing and testing depends on volume of product and temperature gradient which is determined by the system's computer.

Test Period: Response time is 1 minute.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown, message display, and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Ken Wilcox Associates, Inc.
Tel: (816) 443-2494

Date of Evaluation: 08/04/93

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA02630000501 (for Flexible Pipelines)

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.2 gph with P_D=96% and P_{FA}=4%.

Leak Threshold: 0.1 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized flexible pipelines.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 49.6 gallons.

Waiting Time: None between delivery and testing.
Minimum between dispensing and testing depends on volume of product and temperature gradient which is determined by the system's computer.

Test Period: Response time is 45 minutes to 8 hours, 51 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown, message display, and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Ken Wilcox Associates, Inc.
Tel: (816) 443-2494

Date of Evaluation: 08/04/93

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA02630000501 (for Flexible Pipelines)

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.1 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 0.079 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized flexible pipelines.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 49.6 gallons.

Waiting Time: None between delivery and testing.
Minimum between dispensing and testing depends on volume of product and temperature gradient which is determined by the system's computer.

Test Period: Response time is 1 hour, 12 minutes to 12 hours, 54 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown, message display, and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Ken Wilcox Associates, Inc.
Tel: (816) 443-2494

Date of Evaluation: 08/04/93

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA0263000060X

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 3.0 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 1.88 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized fiberglass and steel pipelines.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 98.4 gallons.

Waiting Time: None between delivery and testing.
Minimum of 16 minutes between dispensing and testing.

Test Period: Response time is 28.8 seconds.
Test data are aquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown (optional), message display and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 08/07/91

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA0263000060X

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.2 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 0.17 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized fiberglass and steel pipelines.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 98.4 gallons.

Waiting Time: None between delivery and testing.
Minimum of 45 minutes to 1 hour between dispensing and testing.

Test Period: Response time is 32 to 48 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown (optional), message display and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 12/18/96

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA0263000060X

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.1 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized fiberglass and steel pipelines.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 98.4 gallons.

Waiting Time: None between delivery and testing.
Minimum of 2 hours, 30 minutes between dispensing and testing.

Test Period: Response time is 18 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown (optional), message display and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 08/07/91

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA0263000060X (for Flexible Pipelines)

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 3.0 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 1.5 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized flexible pipelines.
Tests are conducted at 10 psi.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 40.8 gallons.

Waiting Time: None between delivery and testing.
Minimum of 13 minutes between dispensing and testing.

Test Period: Response time is 4 to 6 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown (optional), message display and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 10/16/95

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA0263000060X (for Flexible Pipelines)

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.2 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 0.17 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized flexible pipelines.
Tests are conducted at 30 psi.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 40.8 gallons.

Waiting Time: None between delivery and testing.
Minimum of 4 minutes to 1 hour, 9 minutes between dispensing and testing.

Test Period: Response time is 40 minutes to 1 hour.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown (optional), message display and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
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Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 01/13/97

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA0263000060X (for Flexible Pipelines)

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.1 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized flexible pipelines.
Tests are conducted at operating pressure, with leak rates equivalent to 45 psi line pressure.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 40.8 gallons.

Waiting Time: None between delivery and testing.
Minimum of 1 to 4 hours between dispensing and testing.

Test Period: Response time is 45 minutes to 1 hour, 15 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown (optional), message display and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 10/16/95

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA0263000100X, PA0277000060X

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 3.0 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 2.5 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized fiberglass and steel pipelines.
Tests are conducted at operating pressure, not to exceed 50 psi.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 100 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Response time is 2 seconds
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown (optional), message display and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 05/08/96

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA0263000100X, PA0277000060X

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.2 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 0.17 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized fiberglass and steel pipelines.
Tests are conducted at operating pressure, not to exceed 50 psi.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 100 gallons.

Waiting Time: None between delivery and testing.
Minimum between dispensing and testing is 45 minutes.

Test Period: Response time is 45 minutes
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown (optional), message display and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 05/08/96

Gilbarco Environmental Products

Environmental Management Console (EMC) with Line Leak Detector, Series PA0263000100X, PA0277000060X

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.1 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 0.09 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized fiberglass and steel pipelines.
Tests are conducted at operating pressure, not to exceed 50 psi.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 100 gallons.

Waiting Time: None between delivery and testing.
Minimum of 2 hours between dispensing and testing.

Test Period: Response time is 32 to 48 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Pump shutdown (optional), message display and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
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Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 05/08/96

Gilbarco Environmental Products

EMC Environmental Management Console
EMC Basic Monitoring System Tank Monitor 2, 3, 2.1, and 3.1 PAO238000XXXX
(Capacitance Probe)

AUTOMATIC TANK GAUGING SYSTEM

Certification: Leak rate of 0.2 gph with P_D=99% and P_{FA}=1%.

Leak Threshold: 0.1 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Tank Capacity: Maximum of 15,000 gallons.
Tank must be between 50 and 95% full.

Waiting Time: Minimum of 8 hours, 18 minutes between delivery and testing.
There is no dispensing or delivery during waiting time.

Test Period: Minimum of 5 hours.
Test data are acquired and recorded by the system's computer.
Leak rate is calculated from the difference between the first and last data collected.
There must be no dispensing or delivery during test.

Temperature: Average for product is obtained by a temperature averaging probe.

Water Sensor: Must be used to detect water ingress.
Minimum detectable water level in the tank is 1.40 inches.
Minimum detectable water level change is 0.040 inch.

Calibration: Temperature averaging probe must be calibrated in accordance with manufacturer's instructions.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.
As product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product.
California regulations require at least one test per month after routine product delivery or when the tank is filled to within 10% of the highest operating level during the previous month.
Capacitance probes do not work with oxygenated fuels.

Gilbarco Environmental Products
7300 W. Friendly Ave
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 05/14/93

Gilbarco Environmental Products

EMC Environmental Management Console
EMC Basic Monitoring System Tank Monitor 2.1,3.1, PAO264XXX0000
(Capacitance Probe)

AUTOMATIC TANK GAUGING SYSTEM

Certification: Leak rate of 0.2 gph with P_D=99% and P_{FA}=0.2%.

Leak Threshold: 0.126 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Tank Capacity: Maximum of 15,000 gallons.
Tank must be between 50 and 95% full.

Waiting Time: Minimum of 8 hours, 18 minutes between delivery and testing.
There must be no dispensing or delivery during waiting time.

Test Period: Minimum of 2 hours.
Test data are acquired and recorded by the system's computer.
Leak rate is calculated from the difference between the first and last data collected.
There must be no dispensing or delivery during test.

Temperature: Average for product is determined by a minimum of 5 thermistors.

Water Sensor: Must be used to detect water ingress.
Minimum detectable water level in the tank is 1.52 inches.
Minimum detectable change in water level is 0.027 inch.

Calibration: Thermistors and probe must be calibrated in accordance with manufacturer's instructions.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.
As product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product.
California regulations require at least one test per month after routine product delivery or when the tank is filled to within 10% of the highest operating level during the previous month.
Capacitance probes do not work with oxygenated fuels.

Gilbarco Environmental Products
7300 W. Friendly Ave.
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Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 05/14/93

Gilbarco Environmental Products
EMC Environmental Management Console
EMC Basic Monitoring System Tank Monitor 2.1, 3.1, PAO264XXX0000
(Capacitance Probe)
AUTOMATIC TANK GAUGING SYSTEM

Certification: Leak rate of 0.1 gph with P_D=99% and P_{FA}=0.1%.

Leak Threshold: 0.071 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Tank Capacity: Maximum of 15,000 gallons.
Tank must be minimum 95% full.

Waiting Time: Minimum of 8 hours, 15 minutes between delivery and testing.
Minimum of 30 minutes between dispensing and testing.
There must be no dispensing or delivery during waiting time.

Test Period: Minimum of 2 hours.
Test data are acquired and recorded by the system's computer.
Leak rate is calculated from the difference between the first and last data collected.
There must be no dispensing or delivery during test.

Temperature: Average for product is determined by a minimum of 5 thermistors.

Water Sensor: Must be used to detect water ingress.
Minimum detectable water level in the tank is 1.52 inches.
Minimum detectable water level change is 0.027 inch.

Calibration: Thermistors and probe must be calibrated in accordance with manufacturer's instructions.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.
As product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product.
If the 0.1 gph test is used as a tank tightness test there must be no water present in the backfill (groundwater must be below the bottom of the tank), the tank must be equipped with an overfill protection device, and the product level in the tank must be at the overfill protection device set point. Local agency pre-approval is required. To use this as a monthly test option see Title 23 CCR Section 2643(b)(2).
Capacitance probes do not work with oxygenated fuels.

Gilbarco Environmental Products
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Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 05/14/93

Gilbarco Environmental Products

EMC Environmental Management Console
EMC Basic Monitoring System Tank Monitor 2.1, 3.1, PAO265XXX0000
(Magnetostrictive Probe)

AUTOMATIC TANK GAUGING SYSTEM

Certification: Leak rate of 0.2 gph with P_D=99% and P_{FA}=0.1%.

Leak Threshold: 0.093 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Tank Capacity: Maximum of 15,000 gallons.
Tank must be between 50 and 95% full.

Waiting Time: Minimum of 8 hours, 18 minutes between delivery and testing.
Minimum of 30 minutes between dispensing and testing.
There must be no delivery during waiting time.

Test Period: Minimum of 2 hours.
Test data are acquired and recorded by the system's computer.
Leak rate is calculated from the difference between the first and last data collected.
There must be no dispensing during test.

Temperature: Average for product is determined by a minimum of 5 thermistors.

Water Sensor: Must be used to detect water ingress.
Minimum detectable water level in the tank is 0.544 inch.
Minimum detectable change in water level is 0.027 inch.

Calibration: Thermistors and probe must be calibrated in accordance with manufacturer's instructions.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.
As product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product.
California regulations require at least one test per month after routine product delivery or when the tank is filled to within 10% of the highest operating level during the previous month.

Gilbarco Environmental Products
7300 W. Friendly Ave.
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 05/14/93

Gilbarco Environmental Products
EMC Environmental Management Console
EMC Basic Monitoring System Tank Monitor 2.1, 3.1, PAO265XXX0000
(Magnetostrictive Probe)
AUTOMATIC TANK GAUGING SYSTEM

Certification: Leak rate of 0.1 gph with P_D=99% and P_{FA}=1%.

Leak Threshold: 0.071 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents. Other liquids may be tested after consultation with the manufacturer.

Tank Capacity: Maximum of 15,000 gallons.
Tank must be minimum 95% full.

Waiting Time: Minimum of 8 hours, 15 minutes between delivery and testing.
Minimum of 30 minutes between dispensing and testing.
There must be no delivery during waiting time.

Test Period: Minimum of 3 hours.
Test data are acquired and recorded by the system's computer.
Leak rate is calculated from the difference between the first and last data collected.
There must be no dispensing during test.

Temperature: Average for product is determined by a minimum of 5 thermistors.

Water Sensor: Must be used to detect water ingress.
Minimum detectable water level in the tank is 0.544 inch.
Minimum detectable change in water level is 0.027 inch.

Calibration: Thermistors and probe must be calibrated in accordance with manufacturer's instructions.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.
As product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product.
If the 0.1 gph test is used as a tank tightness test there must be no water present in the backfill (groundwater must be below the bottom of the tank), the tank must be equipped with an overfill protection device, and the product level in the tank must be at the overfill protection device set point. Local agency pre-approval is required. To use this as a monthly test option see Title 23 CCR Section 2643(b)(2).

Gilbarco Environmental Products
7300 W. Friendly Ave.
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 03/14/95

Gilbarco Environmental Products
EMC Series with CSLD, PAO265XXXX100, PA0300XXXX100
(Magnetostrictive Probe)
CONTINUOUS IN-TANK LEAK DETECTION SYSTEM

Certification: Leak rate of 0.2 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 0.16 gph for single tanks at 99% operating mode.
0.15 gph for manifold tank systems at 99% operating mode.
A system should not be declared tight, and a message is printed for the operator, if the test results indicate a loss or gain that exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, waste oil, and solvents.

Tank Capacity: Maximum of 38,170 gallons for single tanks and for all tanks manifolded together.
Contact manufacturer for tank system applications if total tank capacity exceeds 30,000 gallons.

Throughput: Monthly maximum of 221,890 gallons.

Waiting Time: Minimum of 3 hours between delivery and testing.

Temperature: Average for product is determined by a minimum of 5 thermistors.

Water Sensor: Must be used to detect water ingress.
Minimum detectable water level in the tank is 0.54 inch.
Minimum detectable change in water level is 0.027 inch.

Calibration: Thermistors and probe must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.
System set-up menu must be checked to verify that the 99% operating mode option has been selected.

Comments: During installation, the set-up menu provides a choice between a 99% or a 95% operating mode.
This evaluation covers only the 99% operating mode. At this time, there is no evaluation covering the 95% mode.
System reports a quantitative result of pass or fail.
Evaluated using both single and manifold tank systems.
System collects data at naturally occurring product levels without interfering with normal tank operation, and discards data from unstable periods when system performs test.
Data can be collected at any level above 12 inches of product.
Leak rates above 1 gph are either reported as "fail" or as "no idle."
For valid monthly testing, a conclusive test report must be produced for each tank every month. Systems warns the operator if there are no " passing" tests completed during the month. For very active tanks, a tank shut down may become necessary in order for the system to collect enough quiet-time data for a test.
Test procedure used was Midwest Research Institute's "Evaluation of Continuous In-Tank Leak Detection Systems," April 17, 1995.
Constant and variable leaks were mathematically induced into tight tank test records which were collected by systems installed at various active tank sites.
The data base for evaluation of the system included sites with vapor recovery and blending dispensers.
Tanks used in this evaluation contained gasoline and diesel.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Midwest Research Institute
Tel: (816) 753-7600

Date of Evaluation: 06/10/96

Gilbarco Environmental Products

PA02590XXX000

LIQUID-PHASE INTERSTITIAL DETECTOR

Detector:

Output type:	qualitative
Sampling frequency:	continuous
Operating principle:	float switch

Test Results: *

	unleaded gasoline	synthetic gasoline
Accuracy (%)	100	100
Response time (min)	3.66	3.45
Recovery time (min)	<1	<1
Product activation height (cm)	1.28	1.27
Lower detection limit (cm)	1.84	1.65

*At a flow rate of 0.19 gal/hr in 7.6 cm diameter test chamber.

Specificity Results:
Activated: diesel fuel, synthetic fuel, heating oil #2, water.

Comments:
EPA and many states require detection of 1/8 inch (0.32 cm) of product for groundwater monitoring.
Test procedures used were Carnegie Mellon Research Institute's "Test Procedures for Third Party Evaluation of Leak Detection Methods: Point Sensor Liquid Contact Leak Detection Systems": Final Report - November 11, 1991.
Detector is reusable.

Gilbarco Environmental Products
7300 W. Friendly Ave.
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Carnegie Mellon Research Institute
Tel: (412) 268-3495

Date of Evaluation: 07/17/92

Gilbarco Environmental Products

PA02591144000

LIQUID-PHASE INTERSTITIAL DETECTOR

Detector:

Output type:	qualitative
Sampling frequency:	continuous
Operating principle:	float switch

Test Results:

	unleaded gasoline	synthetic gasoline
Accuracy (%)	100	100
Response time (min)	6.00	6.51
Recovery time (min)	<1	<1
Product activation height (cm)	3.67	3.62
Lower detection limit (cm)	4.05	4.17

Specificity Results:
Activated: diesel fuel, synthetic fuel, heating oil #2, water.

Comments:
EPA and many states require detection of 1/8 inch (0.32 cm) of product for groundwater monitoring.
Test procedures used were Carnegie Mellon Research Institute's "Test Procedures for Third Party Evaluation of Leak Detection Methods: Point Sensor Liquid Contact Leak Detection Systems": Final Report - November 11, 1991.
Detector is reusable.

Gilbarco Environmental Products
7300 W. Friendly Ave.
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Carnegie Mellon Research Institute
Tel: (412) 268-3495

Date of Evaluation: 07/17/92

Gilbarco Environmental Products

PA02592000000

LIQUID-PHASE INTERSTITIAL DETECTOR

Detector:

Output type:	qualitative
Sampling frequency:	continuous
Operating principle:	float switch

Test Results:

	unleaded gasoline	synthetic gasoline
Accuracy (%)	100	100
Response time (min)	8.19	8.49
Recovery time (min)	<1	<1
Product activation height (cm)	4.12	3.95
Lower detection limit (cm)	4.67	4.36

Specificity Results:
Activated: diesel fuel, synthetic fuel, heating oil #2, water.

Comments:
EPA and many states require detection of 1/8 inch (0.32 cm) of product for groundwater monitoring.
Test procedures used were Carnegie Mellon Research Institute's "Test Procedures for Third Party Evaluation of Leak Detection Methods: Point Sensor Liquid Contact Leak Detection Systems": Final Report - November 11, 1991.
Detector is reusable.

Gilbarco Environmental Products
7300 W. Friendly Ave.
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Carnegie Mellon Research Institute
Tel: (412) 268-3495

Date of Evaluation: 07/17/92

Gilbarco Environmental Products

Environmental Management Console (EMC)
Groundwater Sensor, series PA02700XX0001

LIQUID-PHASE OUT-OF-TANK PRODUCT DETECTOR

Detector:

Output type:	qualitative
Sampling frequency:	continuous
Operating principle:	electrical conductivity

Test Results:

	unleaded gasoline	synthetic gasoline
Accuracy (%)	100	100
Detection time (min:sec)	08:55	06:18
Fall time (min:sec)	54:50	26:02
Lower detection limit (cm)	0.02	0.02

Specificity Results:
Activated: unleaded gasoline, synthetic gasoline, n-hexane, diesel fuel, jet-A fuel, toluene, xylene(s).

Calibration:
Sensor must be checked annually for operability or in accordance with manufacturer's instructions and calibrated/replaced if necessary.

Comments:
EPA and many states require detection of 1/8 inch (0.32 cm) of product for groundwater monitoring. Detector is reusable.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Carnegie Mellon Research Institute
Tel: (412) 268-3495

Date of Evaluation: 11/20/91

Gilbarco Environmental Products

PA02660000000

VAPOR-PHASE OUT-OF-TANK PRODUCT DETECTOR

Detector:

Output type:	qualitative
Sampling frequency:	continuous
Operating principle:	adsistor

Test Results:

	unleaded gasoline	synthetic gasoline	JP-4 jet fuel
Accuracy (%)	100	0	100
Detection time (min:sec)	7:46	N/A*	17:01
Fall time (min:sec)	2:38	N/A	3:05
Lower detection limit (ppm)	500	>1000	500

*See glossary.

Specificity Results:
Activated: unleaded gasoline, JP-4 jet fuel.
Not activated: synthetic gasoline, n-hexane, toluene, xylene(s).

Comments:
Test procedures used were Radian Corporation's draft report "Development of Procedures to Assess the Performance of External Leak Detection Devices: Vapor-Phase ASTM-Formatted Methods," June 29, 1990.

Gilbarco Environmental Products
7300 W. Friendly Ave.
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Carnegie Mellon Research Institute
Tel: (412) 268-3495

Date of Evaluation: 07/24/92

Hasstech

LineTite Pipeline Leak Monitor

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 3.0 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 2.0 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, and aviation fuel.

Specification: System tests fiberglass and steel pipelines.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed on the pipeline.

Pipeline Capacity: Maximum of 341 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Response time is 1 to 26 minutes.
Test data are acquired and recorded by a permanently installed microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Dispenser shutdown, message display, and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Hasstech
6985 Flanders Dr.
San Diego, CA 92121
Tel: (619) 457-5880

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Dates of Evaluation: 10/15/91 and 04/10/94

Hasstech

LineTight Pipeline Leak Monitor Model 2001J

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 3.0 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 2.5 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and fuel oil #4.

Specification: System tests pressurized fiberglass and steel pipelines.
Tests are conducted at operating pressure, not to exceed 50 psi.

Pipeline Capacity: Maximum of 172 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Response time is 1-5 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Manual testing of pipeline.
Preset threshold.
Single test with multiple data acquisition cycles to determine if pipeline is leaking.
Dispenser shutdown and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
Greensboro, NC 27410
Tel: (336) 547-5000

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 04/15/97

Hasstech

LineTight Pipeline Leak Monitor Model 2001J

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.1 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 0.079 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and solvents.

Specification: System tests pressurized flexible pipelines.
Tests are conducted at operating pressure, not to exceed 50 psi.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 49.6 gallons.

Waiting Time: None between delivery and testing.
Minimum between dispensing and testing is 15 minutes.

Test Period: Response time is 1 hour, 12 minutes to 12 hours, 54 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Manual testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Dispenser shutdown and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Gilbarco Environmental Products
7300 W. Friendly Ave.,
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Tel: (336) 547-5000

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 08/04/93

Hasstech

LineTite Pipeline Leak Monitor

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.1 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 0.062 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, and aviation fuel.

Specification: System tests fiberglass and steel pipelines.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 341 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Response time is 1 hour, 30 minutes to 12 hours, 30 minutes.
Test data are acquired and recorded by a permanently installed microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Dispenser shutdown, message display, and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Hasstech
6985 Flanders Dr.
San Diego, CA 92121
Tel: (619) 457-5880

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Dates of Evaluation: 10/15/91 and 04/10/94

Hasstech

LineTite Pipeline Leak Monitor
(for Flexible Pipelines)

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 3.0 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 2.0 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, and aviation fuel.

Specification: System tests flexible pipelines.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed on the pipeline.

Pipeline Capacity: Maximum of 49.6 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Response time is 1 to 6 minutes.
Test data are acquired and recorded by a permanently installed microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Dispenser shutdown, message display, and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Hasstech
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Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Dates of Evaluation: 10/15/91 and 04/10/94

Hasstech

LineTite Pipeline Leak Monitor
(for Flexible Pipelines)

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.1 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 0.062 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, and aviation fuel.

Specification: System tests flexible pipelines.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity: Maximum of 49.6 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Response time is 2 hours, 18 minutes to 5 hours.
Test data are acquired and recorded by a permanently installed microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Dispenser shutdown, message display, and alarm activation if leak is declared.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

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Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Dates of Evaluation: 10/15/91 and 04/10/94

Hasstech

Tank Compliance Center, Model 700
(7100 Series Magnetostrictive Probe)

AUTOMATIC TANK GAUGING SYSTEM

Certification: Leak rate of 0.2 gph with P_D=99.9% and P_{FA}=0.1%.

Leak Threshold: 0.1 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oil #4, waste oil, solvents and other substances with a specific gravity >0.6 and a viscosity <1500 cp.

Tank Capacity: Maximum of 15,000 gallons.
Tank must be between 50 and 95% full.

Waiting Time: Minimum of 2 hours between delivery and testing.
Minimum of 2 hours between dispensing and testing.
There must be no delivery during waiting time.

Test Period: Minimum of 2 hours.
Test data are acquired and recorded by a computer.
Leak rate is calculated from data determined to be valid by statistical analysis.
There must be no dispensing or delivery during test.

Temperature: Average for product is determined by a minimum of 5 thermistors.

Water Sensor: Must be used to detect water ingress.
Minimum detectable water level in the tank is 0.186 inch.
Minimum detectable change in water level is 0.0048 inch.

Calibration: Thermistors and probe must be checked and calibrated in accordance with manufacturer's instructions.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.
As product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product.
California regulations require at least one test per month after routine product delivery or when the tank is filled to within 10% of the highest operating level during the previous month.

Hasstech
6985 Flanders Dr.
San Diego, CA 92121
Tel: (619) 457-5880

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 03/14/95

Hasstech
Tank Compliance Center, Model 700
(7100 Series Magnetostrictive Probe)
AUTOMATIC TANK GAUGING SYSTEM

Certification: Leak rate of 0.1 gph with P_D=99.6% and P_{FA}=0.4%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oil #4, waste oil, solvents and other substances with a specific gravity >0.6 and a viscosity <1500 cp.

Tank Capacity: Maximum of 15,000 gallons.
Tank must be between 50 and 95% full.

Waiting Time: Minimum of 2 hours between delivery and testing.
Minimum of 2 hours between dispensing and testing.
There must be no delivery during waiting time.

Test Period: Minimum of 6 hours.
Test data are acquired and recorded by a computer.
Leak rate is calculated from data determined to be valid by statistical analysis.
There must be no dispensing or delivery during test.

Temperature: Average for product is determined by a minimum of 5 thermistors.

Water Sensor: Must be used to detect water ingress.
Minimum detectable water level in the tank is 0.1860 inch.
Minimum detectable change in water level is 0.0048 inch.

Calibration: Thermistors and probe must be checked and calibrated in accordance with manufacturer's instructions.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.
As product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product.
If the 0.1 gph test is used as a tank tightness test there must be no water present in the backfill (groundwater must be below the bottom of the tank), the tank must be equipped with an overfill protection device, and the product level in the tank must be at the overfill protection device set point. Local agency pre-approval is required. To use this as a monthly test option see Title 23 CCR Section 2643(b)(2).

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Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 03/14/95

Hasstech

AcuRite

LINE TIGHTNESS TEST METHOD

Certification: Leak rate of 0.1 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: 0.01 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, and fuel oil #4.

Specification: System tests fiberglass and steel pipelines.
Tests are conducted at 150% operating pressure.
Mechanical line leak detector must be removed from pipeline for duration of test.

Pipeline Capacity: Maximum of 75 gallons.

Waiting Time: Minimum of 6 hours between delivery and testing.
Minimum of 30 minutes between dispensing and testing.

Test Period: Minimum of 30 minutes.
Test data are acquired and recorded manually.
Manual calculations are performed by the operator on site.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

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Evaluator: Lamar University
Tel: (409) 880-8788

Date of Evaluation: 03/25/91

Hasstech

Leak Computer Tank Test System

VOLUMETRIC TANK TIGHTNESS TEST METHOD (OVERFILL) (Edison Lab Protocol)

Certification: Leak rate of 0.1 gph with P_D=95% and P_{FA}=5%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oils #4 and #6, waste oil, and solvents.
Other liquids may be tested after consultation with the manufacturer.

Tank Capacity: Maximum of 12,000 gallons.
Tank must be minimum 100% full.

Waiting Time: Test data are acquired and recorded by a computer that calculates a leak rate every minute, and determines waiting time for satisfactory data (test is finished when the standard deviation of 30 sequential leak rates is less than half of the last leak rate determined).
There must be no dispensing or delivery during waiting time.

Test Period: Minimum of 1 hour, 10 minutes.
Test data are acquired and recorded by a computer.
Leak rate is calculated from data determined to be valid by statistical analysis.
There must be no dispensing or delivery of product during test.

Temperature: Average for product is determined by a minimum of 7 thermistors.

Groundwater: If depth to groundwater in backfill cannot be determined, tank must pass a two level test with at least a 3 foot difference in product level.
If depth to groundwater in backfill can be determined, a single level test can be conducted provided a minimum net pressure of 1 psi exists at bottom of tank during test.

Calibration: Level sensor must be calibrated before each test.
Thermistors must be checked annually and calibrated if necessary.

Comments: Not evaluated using manifold tank systems.
Evaluated at EPA Edison Risk Reduction Engineering Laboratory prior to the EPA standard protocols being written.

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Tel: (619) 457-5880

Evaluator: U.S. EPA Risk Reduction Engineering Laboratory
Tel: (201) 321-6631

Date of Evaluation: 11/88

Hasstech

Leak Computer Tank Test System

VOLUMETRIC TANK TIGHTNESS TEST METHOD (UNDERFILL)

Certification: Leak rate of 0.1 gph with P_D>99% and P_{FA}<1.0%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oils #4 and #6, waste oil, and solvents.
Other liquids may be tested after consultation with the manufacturer.

Tank Capacity: Maximum of 15,000 gallons.
Tank must be minimum 90% full.

Waiting Time: Test data are acquired and recorded by a computer that calculates a leak rate every minute, and determines waiting time for satisfactory data (test is finished when the standard deviation of 30 sequential leak rates is less than half of the last leak rate determined).
There must be no dispensing or delivery during waiting time.

Test Period: Minimum of 1 hour, 10 minutes.
Test data are acquired and recorded by a computer.
Leak rate is calculated from data determined to be valid by statistical analysis.
There must be no dispensing or delivery during test.

Temperature: Average for product is determined by a minimum of 7 thermistors.

Groundwater: Depth to groundwater in backfill must be determined. If groundwater is above bottom of tank, product level must be adjusted to provide a minimum net pressure of 1 psi at bottom of tank during test.

Calibration: Level sensor must be calibrated before each test.
Thermistors must be checked annually and calibrated if necessary.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.
As product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product.

Hasstech
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Tel: (619) 457-5880

Evaluator: Law Engineering Industrial Services
Tel: (800) 672-6601

Date of Evaluation: 04/17/91

Heath Consultants, Inc.

Petro Tite Line Tester

LINE TIGHTNESS TEST METHOD

Certification: Leak rate of 0.1 gph with P_D=99.99% and P_{FA}=0.37%.

Leak Threshold: 0.01 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oil.

Specification: System tests fiberglass and steel pipelines.
Tests are conducted at 150% operating pressure.
Mechanical line leak detector must be removed from pipeline for duration of test.

Pipeline Capacity: Maximum of 129 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Minimum of 1 hour (four 15 minute readings).; A 1 hour pretest at or above test pressure is conducted to eliminate the effects of pipe deflection/stretch on the results.
Test data are acquired and recorded manually.

Calibration: System must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Heath Consultants, Inc.
9030 Monroe Rd.
Houston, TX 77061
Tel: (800) 432-8487

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 03/11/91

Heath Consultants, Inc.

Petro Comp

VOLUMETRIC TANK TIGHTNESS TEST METHOD (OVERFILL)

Certification: Leak rate of 0.1 gph with P_D=99% and P_{FA}=0.98%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, solvents, alcohols and water.

Tank Capacity: Maximum of 15,000 gallons.
Tank must be minimum 100% full.
An automatic product leveler must be used to maintain a constant product level during test.

Waiting Time: None between delivery and testing.
There must be no dispensing or delivery during waiting time.

Test Period: Minimum of 2 hours after the completion of the high level circulation.
Test data are acquired and recorded by a computer after the completion of the high level circulation.
Leak rate is calculated based on cumu lative volume change during low level test (generally based on 1 hour average volume change).
Product must be mixed continuously throughout test period.
There must be no dispensing or delivery during test.

Temperature: Average for product is determined by a single temperature sensor.

Groundwater: Depth to groundwater in backfill must be determined. If groundwater is above bottom of tank, product level must be adjusted to provide a minimum net pressure of 4 psi at bottom of tank during test.

Calibration: Temperature sensor is self calibrating.
Level sensor must be checked annually and calibrated if necessary in accordance with manufacturer's instructions.

Comments: Not evaluated using manifold tank systems.

Heath Consultants, Inc.
9030 Monroe Rd.
Houston, TX 77061
Tel: (800)432-8487

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 12/15/90

Heath Consultants, Inc.

Petro Tite II

VOLUMETRIC TANK TIGHTNESS TEST METHOD (OVERFILL)

Certification: Leak rate of 0.1 gph with P_D=99% and P_{FA}=1%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oil #4.

Tank Capacity: Maximum of 15,000 gallons.
Tank must be minimum 100% full.
An automatic product leveler must be used to maintain a constant product level during test.

Waiting Time: None between delivery and testing.
There must be no dispensing or delivery during waiting time.

Test Period: Minimum of 2 hours.
Test data are acquired and recorded manually.
Leak rate calculated based on cumulative volume change during low level test (generally based on 1 hour average volume change).
Product must be mixed continuously throughout test period.
There must be no dispensing or delivery during test.

Temperature: Average for product is determined by a single DTS-2000 digital sensor.

Groundwater: Depth to groundwater in backfill must be determined. If groundwater is above bottom of tank, product level must be adjusted to provide a minimum net pressure of 4 psi at bottom of tank during test.

Calibration: Sensor calibration must be checked at each use and the DTS-2000 recertified a minimum of once every 3 years.

Comments: Not evaluated using manifold tank systems.

Heath Consultants, Inc.
9030 Monroe Rd.
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Tel: (800)432-8487

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 11/01/90

Horner EZY CHECK

EZY-Chek Manual Line Leak Detector

LINE TIGHTNESS TEST METHOD

Certification: Leak rate of 0.1 gph with P_D=98.0% and P_{FA}=1%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oil #4, waste oil, and solvents.

Specification: System tests fiberglass and steel pipelines.
Tests are conducted at 150% operating pressure.
Mechanical line leak detector must be removed from pipeline for duration of test.

Pipeline Capacity: Maximum of 129 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Minimum of 1 hour, 30 minutes.
Data are collected every 15 minutes.
Testing period consists of a monitor mode and test mode.
Data are collected in the monitor mode until two consecutive records are within 0.01 gallon of each other.
Four data points must be taken in test mode for a final gph result.
Test data are acquired and recorded manually.
Manual calculations performed by the operator on site.

Calibration: No temperature sensors used.
No calibration required.
System must be checked annually in accordance with manufacturer's instructions.

Horner EZY CHECK
719 Scheurmann St.
Essexville, MI 48732
Tel: (517)891-9868

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 07/09/92

Horner EZY CHECK

EZY-Chek II Automatic Line Leak Detector

LINE TIGHTNESS TEST METHOD

Certification: Leak rate of 0.1 gph with P_D=99.0% and P_{FA}=1%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oil #4, waste oil, and solvents.

Specification: System tests fiberglass and steel pipelines.
Tests are conducted at 150% operating pressure.

Pipeline Capacity: Maximum of 129 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Minimum of 2 hours.
Data are collected every 30 seconds.
Testing period consists of a monitor mode and test mode.
Data are collected in monitor mode until two consecutive 15 minute records are within 0.01 gallon of each other. Then an additional 15 minutes is required in monitor mode before start of test mode.
Data are collected in test mode for 1 hour, 7 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

Calibration: Sensors must be calibrated before each test.

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Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 07/13/92

Horner EZY CHECK
EZY 3
NON-VOLUMETRIC TANK TIGHTNESS TEST METHOD (VACUUM)

Certification: Leak rate of 0.1 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: A system should not be declared tight when the vacuum decay is more than 1 inch water column pressure for non-volatile products and 10% of the lower determined vapor pressure for volatile products.
A system should also not be declared tight if any water ingress is detected.

Applicability: Gasoline, diesel, aviation fuel, fuel oils #4 and #6, waste oil, and solvents.

Tank Capacity: Maximum of 12,000 gallons if groundwater is not present.
Maximum of 50,000 gallons if groundwater is present and a vacuum of 1.0 to 1.7 psi can be maintained.
For gasoline, ullage volume must be between 800 and 2,500 gallons.
For diesel, ullage volume must be between 500 and 1,500 gallons.

Waiting Time: None between delivery and testing.

Test Period: Minimum of 2 hours, 30 minutes for gasoline (1 hour, 30 minutes vapor equilibrium recirculation time plus 1 hour test period).
Minimum of 1 hour, 30 minutes for diesel and less volatile products (30 minutes vapor equilibrium recirculation time plus 1 hour test period).
The vapor equilibrium recirculation time is the time required to apply a vacuum and to saturate ullage with vapors.
Test data are acquired and recorded manually.

Test Pressure: Vacuum must be maintained between 1.0 to 1.7 psi at bottom of tank.
Vacuum must not be greater than 4.0 psi in ullage.

Temperature: Vacuum decay is independent of product temperature.

Water Sensor: Conductivity water sensor must be used to detect water ingress and must be calibrated for every test.
Minimum detectable water level is 0.014 inch.
Minimum detectable change in water level is 0.0095 inch.
Minimum water level in the tank must be adjusted to 0.014 inch before sensor calibration begins.
Actual water ingress test period depends on tank size and must be calculated in accordance with manufacturer's instructions, but must be a minimum of 1 hour.

Groundwater: Depth to groundwater in backfill must be determined. If groundwater is above bottom of tank, water sensor must be used and test time extended to ensure water ingress detection during test.

Comments: Not evaluated using manifold tank systems.
Evaluated using gasoline and diesel.
Test may not be effective in some backfill (such as clay) because it may plug holes in tank.
If soil is saturated with product, air or water ingress may not be detected by vacuum test. A well point in backfill may help identify presence of this condition.

Horner EZY CHECK
719 Scheurmann St.
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Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Dates of Evaluation: 08/23/94 and 02/08/95

Horner EZY CHECK

Horner EZY-Chek I

VOLUMETRIC TANK TIGHTNESS TEST METHOD (OVERFILL)

Certification: Leak rate of 0.1 gph with P_D=99% and P_{FA}=1%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oil #4, waste oil, and solvents.

Tank Capacity: Maximum of 12,000 gallons.
Tank must be minimum 100% full.

Waiting Time: Minimum of 6 hours between delivery and testing.
Minimum of 3 hours between "topping off" and testing.
Total minimum waiting time is 6 hours.
There must be no product dispensing or delivery during waiting time.

Test Period: Minimum of 1 hour, 30 minutes (30 minute monitor period, plus 1 hour test period).
Testing must continue until data meets manufacturer's stop test criteria.
Volume data are collected and recorded by a strip chart recorder.
Leak rate is calculated from data of last 1 hour of test period.
There must be no dispensing or delivery during test.

Temperature: Average for product is determined by a resistance temperature detector (RTD) and displayed on an LCD readout.

Groundwater: Depth to groundwater in backfill must be determined. If groundwater is above bottom of tank, product level must be adjusted to provide net pressure of 2-4 psi at bottom of tank.
Groundwater level must be stable prior to and during test.

Calibration: Level sensors must be calibrated before each test.

Comments: Not evaluated using manifold tank systems.

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Evaluator: W. A. Kibbe and Associates
Tel: (517) 797-2425

Date of Evaluation: 10/03/90

Horner EZY CHECK

Horner EZY-Chek II

VOLUMETRIC TANK TIGHTNESS TEST METHOD (OVERFILL)

Certification: Leak rate of 0.1 gph with P_D=99.95% and P_{FA}=0.05%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oil #4, waste oil, and solvents.

Tank Capacity: Maximum of 12,000 gallons.
Tank must be minimum 100% full.

Waiting Time: Minimum of 6 hours between delivery and testing.
Minimum of 3 hours between "topping off" and testing.
Total minimum waiting time is 6 hours.
There must be no delivery or dispensing during waiting time.

Test Period: Minimum of 1 hour, 40 minutes (33 minutes monitor mode and 1 hour, 7 minutes test mode).
At the conclusion of test mode, data are checked for the manufacturer's stop test criteria. If data do not meet the criteria, testing must continue.
Test data are acquired and recorded by a computer.
Leak rate is calculated from last 1 hour, 7 minutes of test period data.
There must be no dispensing or delivery during test.

Temperature: Average for product is determined by a resistance temperature detector (RTD).

Groundwater: Depth to groundwater in backfill must be determined. If groundwater is above bottom of tank, product level must be adjusted to provide net pressure of 2-4 psi at bottom of tank.
Groundwater level must be stable prior to and during test.

Calibration: Load cell must be calibrated before each use.

Comments: Not evaluated using manifold tank systems.

Horner EZY CHECK
719 Scheurmann St.
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Tel: (517)891-9868

Evaluator: W. A. Kibbe and Associates
Tel: (517) 797-2425

Date of Evaluation: 09/18/90

Horner EZY CHECK

Horner EZY-Chek II

VOLUMETRIC TANK TIGHTNESS TEST METHOD (UNDERFILL)

Certification: Leak rate of 0.1 gph with P_D=95.79% and P_{FA}=4.21%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oil #4, waste oil, and solvents.

Tank Capacity: Maximum of 12,000 gallons.
Tank must be between 98 and 100% full.

Waiting Time: Minimum of 8 hours between delivery and testing.
There must be no product dispensing or delivery during waiting time.

Test Period: Minimum of 1 hour, 40 minutes (33 minutes monitor mode and 1 hour, 7 minutes test mode).
At the conclusion of test mode, data are checked for the manufacturer's stop test criteria. If data do not meet the criteria, testing must continue.
Test data are acquired and recorded by a computer.
Leak rate calculated from last 1 hour, 7 minutes of test period data.
There must be no dispensing or delivery during test.

Temperature: Average for product is determined by a resistance temperature detector (RTD).

Groundwater: Depth to groundwater in backfill must be determined. If groundwater is above bottom of tank, product level must be adjusted to provide a minimum net pressure of 1 psi at bottom of tank during test. If this cannot be accomplished, then the tank cannot be tested using this method.

Calibration: Load cell must be calibrated before each use.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.
As product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product.

Horner EZY CHECK
719 Scheurmann St.
Essexville, MI 48732
Tel: (800)443-0711

Evaluator: W. A. Kibbe and Associates
Tel: (517) 797-2425

Date of Evaluation: 06/25/90

Horner Products Inc.

SIR PRO 1 Version 1.0

STATISTICAL INVENTORY RECONCILIATION TEST METHOD (QUALITATIVE)

Certification: Leak rate of 0.2 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: **If the absolute value of the calculated leak rate (gain or loss) is less than the leak threshold and the minimum detectable leak rate is less than or equal to 0.2 gph, the test result is "pass." If the absolute value of the calculated leak rate is greater than or equal to the leak threshold, the result is "fail." If the minimum detectable leak rate exceeds 0.2 gph and the absolute value of the calculated leak rate is less than the leak threshold, the test result is "inconclusive."**

Applicability: Gasoline, diesel, aviation fuel, and fuel oil #4.

Tank Capacity: Maximum of 18,000 gallons. **This method is not acceptable for hydraulically manifolded tanks.**

Data Requirement: Minimum of 30 days of product level and flow through data.

Comments: Not evaluated using data from manifolded tanks.
Of 120 data sets submitted for evaluation, 10 were inconclusive.
Median monthly throughput of tanks evaluated was 13,640 gallons.
Leak rate of 0.2 gph was used in evaluation.
Data sets evaluated were supplied by evaluator.

Horner Products Inc.
104 Little Killarney Beach
Bay City, MI 48706
Tel: (800)443-0711

Evaluator: Petro Works
Tel: (913) 681-9379

Date of Evaluation: 04/07/93

Horner Products Inc.

SIR PRO 1 Version 2.0

STATISTICAL INVENTORY RECONCILIATION TEST METHOD (QUALITATIVE)

Certification: Leak rate of 0.1 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: **If the absolute value of the calculated leak rate (gain or loss) is less than the leak threshold and the minimum detectable leak rate is less than or equal to 0.1gph, the test result is "pass." If the absolute value of the calculated leak rate is greater than or equal to the leak threshold, the result is "fail." If the minimum detectable leak rate exceeds 0.1 gph and the absolute value of the calculated leak rate is less than the leak threshold, the test result is "inconclusive."**

Applicability: Gasoline, diesel, aviation fuel, and fuel oil #4.

Tank Capacity: Maximum of 18,000 gallons. **This method is not acceptable for hydraulically manifolded tanks.**

Data Requirement: Minimum of 30 days of product level and flow through data.

Comments: Not evaluated using data from manifold tank systems.
Of 120 data sets submitted for evaluation, 9 were inconclusive.
Median monthly throughput of tanks evaluated was 11,828 gallons.
Leak rate of 0.1 gph was used in evaluation.
Data sets evaluated were supplied by evaluator.

Horner Products Inc.
104 Little Killarney Beach
Bay City, MI 48706
Tel: (800)443-0711

Evaluator: Petro Works
Tel: (913) 681-9379

Date of Evaluation: 04/07/93

Horner Products Inc.

SIR PRO 1 Version 3.0

STATISTICAL INVENTORY RECONCILIATION TEST METHOD (QUANTITATIVE)

Certification: Leak rate of 0.2 gph with P_D>99% and P_{FA}<1%.

Leak Threshold: **If the absolute value of the calculated leak rate (gain or loss) is less than the leak threshold and the minimum detectable leak rate is less than or equal to 0.2 gph, the test result is "pass." If the absolute value of the calculated leak rate is greater than or equal to the leak threshold, the result is "fail." If the minimum detectable leak rate exceeds 0.1 gph and the absolute value of the calculated leak rate is less than the leak threshold, the test result is "inconclusive."**

Applicability: Gasoline, diesel, aviation fuel, and fuel oil #4.

Tank Capacity: Maximum of 33,000 gallons for single tanks. **This method is not acceptable for hydraulically manifolded tanks.**

Data Requirement: Minimum of 30 days of product level and flow through data.

Comments: Not evaluated for manifold tank systems using an acceptable protocol.
73% of data sets were from manifold tank systems.
Of 41 data sets submitted for evaluation, 4 were inconclusive.
Median monthly throughput of tanks evaluated was 22,370 gallons.
Leak rates ranging from 0.05 to 0.216 gph were used in evaluation.
Data sets evaluated were supplied by evaluator.

Horner Products Inc.
104 Little Killarney Beach
Bay City, MI 48706
Tel: (800)443-0711

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 04/07/93

Horner Products Inc.

SIR PRO 1 Version 4.0

STATISTICAL INVENTORY RECONCILIATION TEST METHOD (QUANTITATIVE)

Certification: Leak rate of 0.1 gph with P_D=98% and P_{FA}=2%.

Leak Threshold: **If the absolute value of the calculated leak rate (gain or loss) is less than the leak threshold and the minimum detectable leak rate is less than or equal to 0.2 gph, the test result is "pass." If the absolute value of the calculated leak rate is greater than or equal to the leak threshold, the result is "fail." If the minimum detectable leak rate exceeds 0.2 gph and the absolute value of the calculated leak rate is less than the leak threshold, the test result is "inconclusive."**

Applicability: Gasoline, diesel, aviation fuel, and fuel oil #4.

Tank Capacity: Maximum of 33,000 gallons for single tanks. **This method is not acceptable for hydraulically manifolded tanks.**

Data Requirement: Minimum of 30 days of product level and flow through data.

Comments: Not evaluated for manifold tank systems using an acceptable protocol.
73% of data sets were from manifold tank systems.
Of 41 data sets submitted for evaluation, 4 were inconclusive.
Median monthly throughput of tanks evaluated was 22,370 gallons.
Leak rates ranging from 0.05 to 0.216 gph were used in evaluation.
Data sets evaluated were supplied by evaluator.

Horner Products Inc.
212 Morton St.
104 Little Killarney Beach
Tel: (800)443-0711

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 07/18/95

HT Technologies, Inc.

Vakumatik Models V 60 and V 70 Ex

PRESSURE/VACUUM INTERSTITIAL MONITOR

Certification: Leak rate of 0.1 gph with P_D=100% and P_{FA}=0%.

Leak Threshold: System alarms when liquid enters interstitial space and vacuum decreases (pressure increases) above 34 millibars.

Applicability: Gasoline, diesel.
After consultation with the manufacturer, other liquids may be tested which are compatible with flexible liner.

Tank capacity: Maximum of 20,000 gallons based on interstitial volume resulting when flexible liner is properly fitted and held in position against rigid tank wall.
No minumum product level during test.

Waiting time: None between delivery and testing.

Test Period: Minimum of 120 hours.

Comments: System tests the interstitial space between a properly fitted and installed flexible liner inside a rigid tank, or between the rigid walls of a double-walled tank.
Flexible liner is held in position by maintaining a vacuum on interstitial space.
Interstitial space is tested continuously.
System allows for permeation of vapor from stored substance into interstitial space.
Vapor discharged from vacuum pump must meet applicable air quality standards.
System detects breaches in either flexible internal liner or rigid tank walls.
Test procedures used were modified by evaluator from EPA's "Standard Test Procedures for Evaluating Leak Detection Methods: Nonvolumetric Tank Tightness Testing Methods," March 1990.
Reasonable temperature variations will not cause an alarm or missed detection.

HT Technologies
4360 Brownsboro Rd.
Louisville, KY 40207
Tel: (602) 893-4000

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 08/17/97, Rev. 01/28/98

Ibex Industries

Ibex Precision Test System

VOLUMETRIC TANK TIGHTNESS TEST METHOD (OVERFILL)

Certification: Leak rate of 0.1 gph with P_D=99.5% and P_{FA}=0.5%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oil #4, and solvents.

Tank Capacity: Maximum of 18,000 gallons.
Tank must be between 92 and 100% full.

Waiting Time: Minimum of 12 hours between delivery and testing.
Minimum of 3 hours between "topping off" and testing.
There must be no product dispensing or delivery during waiting time.

Test Period: Minimum of 1 hour.
Test data are acquired and recorded by a computer.
Leak rate calculated from data determined valid by statistical analysis.
There must be no dispensing or delivery during test.

Temperature: Average for product is determined by a minimum of 6 temperature sensors.

Groundwater: Depth to groundwater in backfill must be determined. If groundwater is above bottom of tank, product level must be adjusted to provide net pressure of 2-4 psi on bottom of tank during test.

Calibration: Level sensors must be calibrated before each test.
Temperature sensors must be calibrated semi-annually.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.

Ibex Industries
Moved and left no forwarding address or phone number.

Evaluator: Applied Research Center
Tel: (805) 664-2173

Date of Evaluation: 01/18/91

INCON Intelligent Controls, Inc.

TS-LLD Line Leak Detector

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 3 gph with P_D = 100% and P_{FA} = 0%.

Leak Threshold: 1.5 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuels, and fuel oil #4.

Specification: System tests pressurized fiberglass and steel pipelines.
Tests are conducted at operating pressure.

Pipeline Capacity: Maximum of 163 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Response time is 3 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Dispenser shutdown, numerical "fail" code display and LED alarm light activation if leak is declared.

Calibration: System must be checked annually in accordance with manufacturer's instructions.

INCON Intelligent Controls, Inc.
74 Industrial Park Rd.
Saco, ME 04072
Tel: (800) 872-3455

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 07/06/95

INCON Intelligent Controls, Inc.

TS-LLD Line Leak Detector

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.2 gph with P_D = 100% and P_{FA} = 0%.

Leak Threshold: 0.1 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuels, and fuel oil #4.

Specification: System tests pressurized fiberglass and steel pipelines.
Tests are conducted at operating pressure.

Pipeline Capacity: Maximum of 163 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Response time is 50 minutes to 8 hours for rigid piping.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Dispenser shutdown, numerical "fail" code display and LED alarm light activation if leak is declared.

Calibration: System must be checked annually in accordance with manufacturer's instructions.

Comments: After 28 days have elapsed since the last passing monthly line leak test, system shuts off the submersible pump.
System display will flash number of days since the last passing test.
Operator may reset button to enable dispensing for a 24 hour period.
This procedure may be used for a maximum of 4 days.
After 32 days have elapsed since last monthly test, system will disable dispensing and automatically initiate a test, and system will not authorize dispensing until a test is passed or system is serviced.

INCON Intelligent Controls, Inc.
74 Industrial Park Rd.
Saco, ME 04072
Tel: (800) 872-3455

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 07/06/95

INCON Intelligent Controls, Inc.

TS-LLD Line Leak Detector

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.1 gph with P_D = 100% and P_{FA} = 0%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuels, and fuel oil #4.

Specification: System tests pressurized fiberglass and steel pipelines.
Tests are conducted at operating pressure.

Pipeline Capacity: Maximum of 163 gallons.

Waiting Time: None between delivery and testing.
Minimum of 8 hours between dispensing and testing.

Test Period: Response time is 40 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Dispenser shutdown, numerical "fail" code display and LED alarm light activation if leak is declared.

Calibration: System must be checked annually in accordance with manufacturer's instructions.

INCON Intelligent Controls, Inc.
74 Industrial Park Rd.
Saco, ME 04072
Tel: (800) 872-3455

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 07/06/95

INCON Intelligent Controls, Inc.

TS-LLD Line Leak Detector
(for Flexible Pipelines)

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 3 gph with P_D = 100% and P_{FA} = 0%.

Leak Threshold: 1.5 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuels, and fuel oil #4.

Specification: System tests flexible pipelines.
Tests are conducted at operating pressure.

Pipeline Capacity: Maximum of 49.6 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Response time is 3 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Dispenser shutdown, numerical “fail” code display and LED alarm light activation if leak is declared.

Calibration: System must be checked annually in accordance with manufacturer’s instructions.

INCON Intelligent Controls, Inc.
74 Industrial Park Rd.
Saco, ME 04072
Tel: (800) 872-3455

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 07/06/95

INCON Intelligent Controls, Inc.

TS-LLD Line Leak Detector
(for Flexible Pipelines)

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.2 gph with P_D = 100% and P_{FA} = 0%.

Leak Threshold: 0.1 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuels, and fuel oil #4.

Specification: System tests flexible pipelines.
Tests are conducted at operating pressure.

Pipeline Capacity: Maximum of 49.6 gallons.

Waiting Time: None between delivery and testing.
None between dispensing and testing.

Test Period: Response time is 2 hours, 21 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Dispenser shutdown, numerical "fail" code display and LED alarm light activation if leak is declared.

Calibration: System must be checked annually in accordance with manufacturer's instructions.

Comments: After 28 days have elapsed since the last passing monthly line leak test, system shuts off the submersible pump.
System display will flash number of days since the last passing test.
Operator may reset button to enable dispensing for a 24 hour period.
This procedure may be used for a maximum of 4 days.
After 32 days have elapsed since last monthly test, system will disable dispensing, and automatically initiate a test, and system will not authorize dispensing until a test is passed or system is serviced.

INCON Intelligent Controls, Inc.
74 Industrial Park Rd.
Saco, ME 04072
Tel: (800) 872-3455

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 07/06/95

INCON Intelligent Controls, Inc.

TS-LLD Line Leak Detector
(for Flexible Pipelines)

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification: Leak rate of 0.1 gph with P_D = 100% and P_{FA} = 0%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuels, and fuel oil #4.

Specification: System tests flexible pipelines.
Tests are conducted at operating pressure.

Pipeline Capacity: Maximum of 49.6 gallons.

Waiting Time: None between delivery and testing.
Minimum of 8 hours between dispensing and testing.

Test Period: Response time is 50 minutes.
Test data are acquired and recorded by a microprocessor.
Calculations are automatically performed by the microprocessor.

System Features: Permanent installation on pipeline.
Automatic testing of pipeline.
Preset threshold.
Single test to determine if pipeline is leaking.
Dispenser shutdown, numerical "fail" code display and LED alarm light activation if leak is declared.

Calibration: System must be checked annually in accordance with manufacturer's instructions.

INCON Intelligent Controls, Inc.
74 Industrial Park Rd.
Saco, ME 04072
Tel: (800) 872-3455

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 07/06/95

INCON Intelligent Controls, Inc.

TS 1000/1001/2001
(Magnetostrictive Probe)

AUTOMATIC TANK GAUGING SYSTEM

Certification: Leak rate of 0.2 gph with P_D=99.9% and P_{FA}=0.1%.

Leak Threshold: 0.1 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel and fuel oil #4.
Other liquids may be tested after consultation with the manufacturer.

Tank Capacity: Maximum of 15,000 gallons.
Tanks less than 95% full may be tested.
Minimum product level required based on tank diameter is as follows:
48" dia/ min 12"; **64**" dia/ min 14"; **72**"dia/ min 15"; **96**" dia/ min 17.5";
126"dia/min. 21.5".

Waiting Time: Minimum of 6 hours 1 minute between delivery and testing.
None between dispensing and testing.
There must be no delivery during waiting time

Test Period: Length of the test is determined automatically based on quality of test data.
Average data collection time during evaluation was 5 hours 10 minutes.
Test data are acquired and recorded by a microprocessor.
Leak rate is calculated from data determined to be valid by statistical analysis.
There must be no dispensing or delivery during the test.

Temperature: Probe contains 5 thermistors to monitor product temperature. At least one thermistor must be submerged in product during testing.

Water Sensor: Must be used to detect water ingress.
Minimum detectable water level in the tank is 0.208 inch.
Minimum detectable water level change is 0.011 inch.

Calibration: Thermistors and probe must be checked and calibrated in accordance with manufacturer's instructions.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.
As the product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product. TS1000 and 1001 can support up to 4 tanks. TS2001can support up to 8 tanks.
California regulations require at least one test per month after routine product delivery or when the tank is filled to within 10% of the highest operating level during the previous month.

INCON Intelligent Controls, Inc.
74 Industrial Park Rd.
Saco, ME 04072
Tel: (800) 872-3455

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 08/05/92 and 09/05/97

INCON Intelligent Controls, Inc.

TS 1000/1001/2001
Incon LL2 Magnetostrictive Probe
AUTOMATIC TANK GAUGING SYSTEM

Certification: Leak rate of 0.2 gallons per hour with P_d=95.7% and P_{fa}=4.3%.

Leak Threshold: 0.1 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel and fuel oil #4.
Other liquids may be tested after consultation with the manufacturer.

Capacity: Maximum of 30,000 gallons.
Tanks less than 95% full may be tested.
Minimum product level required based on tank diameter as follows:
48" dia/ min 12"; **64**" dia/ min 14"; **72**"dia/ min 15"; **96**" dia/ min 17.5"; **126**"dia/min. 21.5".

Waiting Time: Minimum of 4 hours 9 minute between delivery and testing.
Minimum of 2 hours between dispensing and testing.
There must be no delivery during waiting time.

Test Period The length of the test is determined automatically based on quality of test data.
Average data collection time during the evaluation was 6 hours, 51 minutes.
Test data is acquired and recorded by a computer.
Leak rate is calculated from data determined to be valid by statistical analysis.
There must be no dispensing or delivery during the test.

Temperature: Probe contains 5 thermistors to monitor product temperature. At least one thermistor must be submerged in product during testing.

Water Sensor: Must be used to detect water ingress. Minimum detectable water level in the tank is 0.208 inches. Minimum detectable water level change is 0.011 inch.

Calibration: Thermistors and probe must be checked and calibrated in accordance with manufacturer's instructions.

Comments: This equipment was not evaluated using manifolded tanks.
Tests only the portion of the tank containing product.
As the product level is lowered, the leak rate in a leaking tank decreases (lower head pressure). Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product. TS1000 and 1001 can support up to 4 tanks. TS2001can support up to 8 tanks.
California regulations require at least one test per month after routine product delivery or when the tank is filled to within 10% of the highest operating level during the previous month.

INCON Intelligent Controls, Inc.
74 Industrial Park Rd.
Saco, ME 04072
Tel: (800) 872-3455

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 05/14/98

INCON Intelligent Controls, Inc.
TS 1000/1001/2001
(Magnetostrictive Probe)
AUTOMATIC TANK GAUGING SYSTEM

Certification: Leak rate of 0.1 gph with P_D=99.9% and P_{FA}=0.1%.

Leak Threshold: 0.05 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel and fuel oil #4.
Other liquids may be tested after consultation with the manufacturer.

Tank Capacity: Maximum of 15,000 gallons.
Tanks less than 95% full may be tested.
Minimum product level required based on tank diameter is as follows:
48" dia/ min 12"; **64**" dia/ min 14"; **72**"dia/ min 15"; **96**" dia/ min 17.5";
126"dia/min. 21.5".

Waiting Time: Minimum of 5 hours 18 minutes between delivery and testing.
None between dispensing and testing.
There must be no delivery during waiting time

Test Period: Length of the test is determined automatically based on quality of test data.
Average data collection time during evaluation was 5 hours 44 minutes.
Test data are acquired and recorded by a microprocessor.
Leak rate is calculated from data determined to be valid by statistical analysis.
There must be no dispensing or delivery during the test.

Temperature: Probe contains 5 thermistors to monitor product temperature. At least one thermistor must be submerged in product during testing.

Water Sensor: Must be used to detect water ingress.
Minimum detectable water level in the tank is 0.208 inch.
Minimum detectable water level change is 0.011 inch.

Calibration: Thermistors and probe must be checked and calibrated in accordance with manufacturer's instructions.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.
As the product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure).
Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product.
TS1000 and 1001 can support up to 4 tanks. TS2001 can support up to 8 tanks.
If the 0.1 gph test is used as a tank tightness test there must be no water present in the backfill (groundwater must be below the bottom of the tank), the tank must be equipped with an overfill protection device, and the product level in the tank must be at the overfill protection device set point. Local agency pre-approval is required. To use this as a monthly test option see Title 23 CCR Section 2643(b)(2).

INCON Intelligent Controls, Inc.
74 Industrial Park Rd.
Saco, ME 04072
Tel: (800) 872-3455

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 09/05/97

INCON Intelligent Controls, Inc.

TS 2000
(Magnetostrictive Probe)

AUTOMATIC TANK GAUGING SYSTEM

Certification: Leak rate of 0.2 gph with P_D=99.9% and P_{FA}=0.5%.

Leak Threshold: 0.058 gph. A system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.

Applicability: Gasoline, diesel, aviation fuel, fuel oil, and waste oil.
Other liquids may be tested after consultation with the manufacturer.

Tank Capacity: Maximum of 15,000 gallons.
Tank must be between 50 and 95% full.

Waiting Time: Minimum of 6 hours between delivery and testing.
Minimum of 2 hours between dispensing and testing.
There must be no delivery during waiting time.

Test Period: Minimum of 3 hours.
Test data are acquired and recorded by a computer.
Leak rate is calculated from data determined to be valid by statistical analysis.
There must be no dispensing or delivery during test.

Temperature: Average for product is determined by a minimum of 5 resistance temperature detectors (RTDs).

Water Sensor: Must be used to detect water ingress.
Minimum detectable water level in the tank is 1.04 inches.
Minimum detectable water level change is 0.011 inch.

Calibration: RTDs and probe must be checked and calibrated in accordance with manufacturer's instructions.

Comments: Not evaluated using manifold tank systems.
Tests only portion of tank containing product.
As product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected.
EPA leak detection regulations require testing of the portion of the tank system which routinely contains product.
TS 2000 can support up to 4 tanks.
California regulations require at least one test per month after routine product delivery or when the tank is filled to within 10% of the highest operating level during the previous month.

INCON Intelligent Controls, Inc.
74 Industrial Park Rd.
Saco, ME 04072
Tel: (800) 872-3455

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494

Date of Evaluation: 05/10/91

INCON Intelligent Controls, Inc.

Tank Sentinel TS-1000EFI
TSP-DIS BriteSensor

LIQUID-PHASE INTERSTITIAL DETECTOR

Detector:

Output type:	qualitative
Sampling frequency:	continuous
Operating principle:	opto-electric

Test Results:

	unleaded gasoline	water	synthetic gasoline	diesel fuel	heating oil #2
Accuracy (%)	100	100	100	100	100
Detection time (min:sec)	03:13	03:18	03:17	3:00	3:02
Fall time (min)	<01	<01	<01	<01	<01
Lower detection limit (cm)					
product activation height	1.60	1.92	N/D*	N/D	N/D

* See glossary.

Specificity Results:
Activated: unleaded gasoline, synthetic gasoline, diesel fuel, heating oil #2, water.

Comments:
EPA and many states require detection of 1/8 inch (0.32 cm) of product for groundwater monitoring.
Test procedures used were Carnegie Mellon Research Institute's "Test Procedures for Third Party Evaluation of Leak Detection Methods: Point Sensor Liquid Contact Leak Detection Systems": Final Report - November 11, 1991.
Detector is reusable.

INCON Intelligent Controls, Inc.
74 Industrial Park Rd.
Saco, ME 04072
Tel: (800) 872-3455

Evaluator: Carnegie Mellon Research Institute
Tel: (412) 268-3495

Date of Evaluation: 12/09/94

INCON Intelligent Controls, Inc.

Tank Sentinel TS-1000EFI
TSP-HIS BriteSensor

LIQUID-PHASE INTERSTITIAL DETECTOR

Detector:

Output type: qualitative
Sampling frequency: continuous
Operating principle: magnetic switch

Test Results:

	50 % by weight Ethylene glycol in water		30 % by weight Calcium chloride in water	
	up	down	up	down
Accuracy (%)	100	100	100	100
Response time (min:sec)	17.41	16:47	17:28	16:56
Recovery time (min)	<1	<1	<1	<1
Lower Detection Limit (cm)				
Product activation height	19.56	2.53	19.40	2.50

Specificity Results:
Activated: 50 % by weight Ethylene glycol in water, 30 % by weight Calcium chloride in water.

Comments:
Intended to monitor level of either ethylene glycol or calcium chloride solutions in interstitial or annular space of a double-walled tank. Activates if any significant gain or loss of solution occurs.
Test procedures used were modified by evaluator from Carnegie Mellon Research Institute's "Test Procedures for Third Party Evaluation of Leak Detection Methods: Point Sensor Liquid Contact Leak Detection Systems": Final Report - November 11, 1991.
Detector is reusable.

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Evaluator: Carnegie Mellon Research Institute
Tel: (412) 268-3495

Date of Evaluation: 03/20/95

INCON Intelligent Controls, Inc.

Tank Sentinel TS-1000/TS-2000
TSP-EIS Standard Sensor, TSP-PS Liquid Contact Sensor

LIQUID-PHASE INTERSTITIAL DETECTOR

Detector:

Output type:	qualitative
Sampling frequency:	continuous
Operating principle:	opto-electric

Test Results:

TSP-EIS	unleaded gasoline	water	synthetic gasoline	diesel fuel	heating oil #2
Accuracy (%)	100	100	100	100	100
Detection time (min:sec)	03:01	03:07	03:17	3:00	3:02
Fall time (min)	<01	<01	<01	<01	<01
Lower detection limit (cm)					
product activation height	1.50	N/D*	N/D	N/D	N/D

Test Results:

TSP-PS	unleaded gasoline	water	synthetic gasoline	diesel fuel	heating oil #2
Accuracy (%)	100	100	100	100	100
Detection time (min:sec)	01:14	01:25	01:13	01:10	01:16
Fall time (min)	<01	<01	<01	<01	<01
Lower detection limit (cm)					
product activation height	1.37	N/D	N/D	N/D	N/D

* See glossary.

Specificity Results:
Activated: unleaded gasoline, synthetic gasoline, diesel fuel, heating oil #2, water.

Comments:
EPA and many states require detection of 1/8 inch (0.32 cm) of product for groundwater monitoring.
Test procedures used were Carnegie Mellon Research Institute's "Test Procedures for Third Party Evaluation of Leak Detection Methods: Point Sensor Liquid Contact Leak Detection Systems": Final Report - November 11, 1991.
Detector is reusable.

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Dates of Evaluations: EIS - 01/30/96; PS - 7/02/93

INCON Intelligent Controls, Inc.

Tank Sentinel TS-1000/TS-2000
TSP-HLS Standard Sensor, TSP-ULS Standard Sensor

LIQUID-PHASE INTERSTITIAL DETECTOR

Detector:

Output type:	qualitative
Sampling frequency:	continuous
Operating principle:	magnetic switch

Test Results:

TSP-HLS	unleaded gasoline	water	synthetic gasoline	diesel fuel	heating oil #2
Accuracy (%)	100	100	100	100	100
Detection time (min:sec)	10:09	09.25	10:14	09:55	10:25
Fall time (min)	<01	<01	<01	<01	<01
Lower detection limit (cm)					
product activation height	5.64	N/D*	N/D	N/D	N/D

Test Results:

TSP-ULS	unleaded gasoline	water	synthetic gasoline	diesel fuel	heating oil #2
Accuracy (%)	100	100	100	100	100
Detection time (min:sec)	03:50	03.34	03:49	03:50	03:41
Fall time (min)	<01	<01	<01	<01	<01
Lower detection limit (cm)					
product activation height	2.70	N/D	N/D	N/D	N/D

* See glossary.

Specificity Results:
Activated: unleaded gasoline, synthetic gasoline, diesel fuel, heating oil #2, water.

Comments:
EPA and many states require detection of 1/8 inch (0.32 cm) of product for groundwater monitoring.
Test procedures used were Carnegie Mellon Research Institute's "Test Procedures for Third Party Evaluation of Leak Detection Methods: Point Sensor Liquid Contact Leak Detection Systems": Final Report - November 11, 1991.
Detector is reusable.

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Date of Evaluations: 01/30/96

INCON Intelligent Controls, Inc.

Tank Sentinel TS-1000EFI
TSP-DDS BriteSensor, TSP-DTS BriteSensor

LIQUID-PHASE OUT-OF-TANK PRODUCT DETECTOR

Detector:

Output type: qualitative
Sampling frequency: continuous
Operating principle: magnetic switch, float, and hydrocarbon sensitive polymer

Test Results:

TSP-DDS	unleaded gasoline	water - low level	water - high level	synthetic gasoline	diesel fuel	heating oil #2
Accuracy (%)	100	100	100	100	100	100
Detection time (min:sec)	05:35	06:02	06:09	06:00	38:43	38:16
Fall time (min:sec)	34:27	<01:00	<01:00	28:53	> 60:00	> 60:00
Lower detection limits (cm)						
product activation height	0.50	N/D*	3.16	N/D	N/D	N/D
product thickness on water	0.04	N/D	N/D	N/D	N/D	N/D

Test Results:

TSP-DTS	unleaded gasoline	water - low level	water - high level	synthetic gasoline	diesel fuel	heating oil #2
Accuracy (%)	100	100	100	100	100	100
Detection time (min:sec)	06:02	06:02	06:13	05:59	38:43	38:16
Fall time (min:sec)	22:28	<01:00	<01:00	28:53	> 60:00	> 60:00
Lower detection limits (cm)						
product activation height	0.50	N/D	3.16	N/D	N/D	N/D
product thickness on water	0.04	N/D	N/D	N/D	N/D	N/D

* See glossary.

Specificity Results:
Activated: unleaded gasoline, synthetic gasoline, diesel fuel, heating oil #2, water.

Comments:
EPA and many states require detection of 1/8 inch (0.32 cm) of product for groundwater monitoring.
Test procedures used were Carnegie Mellon Research Institute's "Test Procedures for Third Party Evaluation of Leak Detection Methods: Point Sensor Liquid Contact Leak Detection Systems": Final Report - November 11, 1991. The procedures for lower detection limit for product thickness were EPA's "Standard Test Procedures for Evaluating Leak Detection Methods: Liquid-Phase Out-of-Tank Product Detectors," March 1990.
Detector is reusable.

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Tel: (412) 268-3495

Date of Evaluations: 12/09/94

INCON Intelligent Controls, Inc.

Tank Sentinel TS-1000EFI
TSP-MWS BriteSensor Groundwater Probe

LIQUID-PHASE OUT-OF-TANK PRODUCT DETECTOR

Detector:

Output type:	qualitative
Sampling frequency:	continuous
Operating principle:	hydrocarbon-sensitive polymer

Test Results:

	unleaded gasoline	synthetic gasoline
Accuracy (%)	100	100
Detection time (min:sec)	10:13	06:42
Fall time (min:sec)	26:52	14:43
Lower detection limit (cm)	0.04	0.04

Specificity Results:
Activated: unleaded gasoline, synthetic gasoline, n-hexane, diesel fuel, jet-A fuel, toluene, xylene(s).

Comments:
EPA and many states require detection of 1/8 inch (0.32 cm) of product for groundwater monitoring. Detector is reusable.

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Evaluator: Carnegie Mellon Research Institute
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Date of Evaluation: 02/19/96